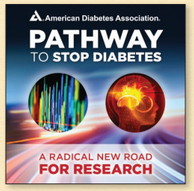
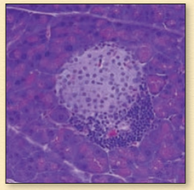
Pathway to Stop Diabetes: A Radical New Road for Research



To accelerate the scientific discoveries needed to ultimately end the diabetes epidemic, the Association has launched a bold new research initiative, ***Pathway to Stop Diabetes***.

Pathway will support creative scientists who are just starting their careers in diabetes research—or who are already established in another field but want to expand their focus to diabetes. Through individual awards of $1.625 million over the course of five to seven years, the program will allow researchers to explore new ideas without the distraction of having to pursue additional grant support. With a goal of funding 100 diabetes researchers over the next decade, ***Pathway*** will provide crucial support to individuals focusing on innovative ideas and transformational approaches.

Novel Approach to Suppress Autoimmunity in Type 1 Diabetes



Researchers from the University of Cincinnati College of Medicine have successfully prevented type 1 diabetes in mice using a novel approach to suppress the autoimmune response that destroys insulin-producing beta cells. By honing in on a particular genetic region that has been linked to type 1 diabetes, Kritika Kachapati, PhD, and William Ridgway, MD, discovered that a molecule, called soluble CD137, has highly immunosuppressive properties and prevents the autoimmune response. In addition, they are developing a technique to deliver the molecule directly to the pancreatic cells, specifically where autoimmunity results in tissue destruction, while avoiding suppression of the entire immune system. The scientists are currently trying to determine whether the molecule can not only prevent type 1 diabetes, but also reverse the disease after diagnosis. Published in the *Journal of Immunology*, the results may open new directions in type 1 diabetes research and therapy.

New Open Access Journal Launched in Collaboration with BMJ

American Diabetes Association. & BMJ

In collaboration with BMJ—known for its flagship *The British Medical Journal*—the Association has launched a new open access journal called *BMJ Open Diabetes Research & Care*. The online-only publication offers scientists free and readily available access to the latest research findings in diabetes treatment and care. Content is competitively peer-reviewed by top experts in the field, ensuring an accurate and dependable resource for all aspects of basic and clinical research in diabetes and related complications. The partnership is a critical addition to the Association's other scientific and medical publishing efforts, as well as to the global fight against diabetes.

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American Diabetes Association Research Programs
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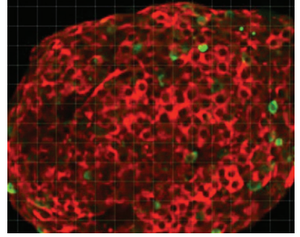
Research Foundation™
Science. Progress. Hope.

For decades, generous gifts from philanthropic-minded individuals, foundations, and businesses have enabled the American Diabetes Association and its Research Foundation to fund brilliant scientific investigators who are committed to improving the lives of all individuals affected by diabetes. The efforts of Association-funded researchers have unlocked many mysteries surrounding one of the nation's most relentless diseases. Each discovery leads us toward better therapies to treat diabetes and increases our hope in finding a cure.

If you would like expanded information on supporting cutting-edge diabetes research, please call 1-800-676-4065 ext. 3413 or email ResearchFoundation@diabetes.org.



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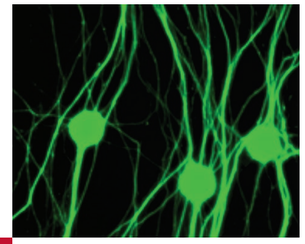
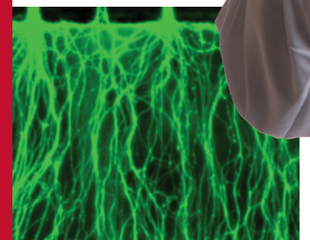
Research Highlights

Recent Scientific Advancements, Breakthroughs, and Initiatives Funded by the American Diabetes Association





Hubert Tse, PhD
University of Alabama-Birmingham
Career Development Awardee

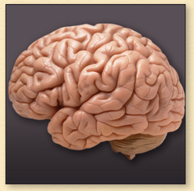
The following highlights showcase exciting recent discoveries from Association-supported scientists and new initiatives that are expanding and advancing the field of diabetes research. These stories provide concrete examples of how research improves our understanding of diabetes and presents new ways to combat the disease and its complications. Progress like this can only be made through continued support of diabetes research and the dedication of the many donors, volunteers, researchers, and clinicians who all work so diligently to Stop Diabetes®. Thank you!

Repairing Nerve Damage in Diabetes

Funded by the Order of the Amaranth Diabetes Foundation

Almost two-thirds of people with diabetes will eventually suffer from neuropathy—nerve damage that can become debilitating due to symptoms of pain, discomfort, and numbness in the extremities. Diabetes compromises the health of the nervous system by making it more sensitive to injury and also by delaying the repair and re-growth of injured neurons. Dianna E. Willis, PhD, from the Burke-Cornell Medical Research Institute, has shed new light on why sensory nerve cells may be more susceptible to damage in people with diabetes. She has discovered that intracellular transport to the site of nerve damage is impaired in animals with diabetes, resulting in diminished local production of certain molecules important for repair. These defects may be related to the nerves' inability to effectively heal and regenerate following injury. Further exploration of these molecules and how they are regulated may point to new therapeutic approaches for maintaining neuronal health in people with diabetes.

Diabetes Risk Increased by Brain's Response to Binge Drinking



Binge drinking is defined as a pattern of drinking that rapidly raises blood alcohol concentration to 0.08 gram percent or above. Typically, this would result from consuming five alcoholic beverages within a two-hour time span for men, or four drinks for women. A study conducted by a Mount Sinai School of Medicine researcher indicates that binge drinking may increase the risk for developing metabolic syndrome and type 2 diabetes. Many alcoholic beverages are high in calories, which can contribute to weight gain and insulin resistance. Yet in the January 30, 2013 issue of *Science Translational Medicine*, Christoph Buettner, MD, PhD, found that consuming alcohol in a binge pattern induces insulin resistance independent of caloric intake. Rather, binge drinking appears to impair the way the brain responds to insulin, even well after the alcohol has been cleared from the system. Dr. Buettner warns that people who regularly binge drink–even just once a week–may remain in an insulin-resistant state for an extended period of time, setting the stage for diabetes.

American Diabetes Association 73rd Annual Scientific Sessions

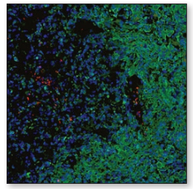
73rd scientificsessions

The Association's annual Scientific Sessions is the world's largest diabetes meeting. This June in Chicago, thousands of scientists, clinicians, and educators gathered to present and discuss the latest research and clinical advances in diabetes.

The Sessions mark a high point for the diabetes community each year. By providing a forum for communicating and translating a tremendous amount of information to a broad audience, the meeting expands the field of diabetes knowledge and accelerates progress toward a cure. Nearly 18,000 people, representing all 50 states and 117 countries, participated in the program that included 368 invited symposium speakers and more than 2,500 abstracts.

Among those presentations, more than **225 Association-funded researchers shared their findings**, including the following highlights:

Tuberculosis and Diabetes: an Immune Connection



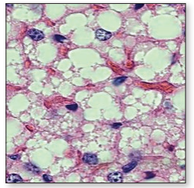
People with diabetes are not only more susceptible to contracting tuberculosis (TB), but the severity of their TB infection is much greater and considerably more difficult to treat than in people without diabetes. In addition, diabetes control in patients with TB is often more difficult to maintain. This is particularly concerning with the increasing diabetes prevalence in regions like Asia and Africa, where TB is also a critical public health concern. Using a novel guinea pig model closely resembling simultaneous diabetes and TB infection in humans, Colorado State University scientist Randall J. Basaraba, DVM, PhD, working with graduate student Brendan Podell, DVM, found that an unbalanced immune response to *Mycobacterium tuberculosis*—the bacteria that causes TB—may explain why people with diabetes experience a heightened severity of TB complications. The immune defect is associated with an inability to control the infection, resulting in an overgrowth of the *Mycobacterium* and a more severe case of TB. With the incidence of TB and diabetes co-morbidity increasing at an alarming rate, this type of research is critical to gain a better understanding of their interactions, and in helping physicians improve the prevention, diagnosis, and treatment of both conditions when they occur together.

Insulin Action Protects Vascular Health

Presidential Presentation

Kyoungmin Park, PhD, a young and promising investigator from Joslin Diabetes Center, was selected to present his research findings in the prestigious President's Oral Session at this year's meeting. Identified as one of the top 12 abstracts from more than 3,000 submissions, Dr. Park and his mentor, George L. King, MD, have shown that insulin has protective effects on blood vessels and can prevent vascular damage induced by high blood sugar or insulin resistance. Their study also shows that improving insulin activity, which is inhibited in people with diabetes, specifically inside the cells that line the arteries can reduce harmful plaque buildup caused by consuming a high-fat diet. Uncovering the mechanism by which diabetes changes insulin's action in blood vessels may lead to new treatments designed to correct atherosclerosis and the other vascular complications of diabetes.

Brown Fat Transplant Improves Metabolic Health



A study conducted by researchers at Joslin Diabetes Center suggests that brown fat transplants could help combat obesity and lower the risk of developing type 2 diabetes. Laurie J. Goodyear, PhD, and postdoctoral fellows Kristin Stanford, PhD, and Roeland J.W. Middelbeek, MD, showed that increasing brown fat mass via transplantation dramatically promoted weight loss and improved blood-glucose control in mice. Transplantation of brown fat into overweight mice fed a high-fat diet also reversed many of the problems associated with such eating habits: it slowed weight gain, reversed insulin-resistance, and improved lipid profiles. Increasing the amount of transplanted brown fat further amplified the metabolic benefits. With the worldwide obesity epidemic on the rise, the researchers hope to quickly translate their findings into humans and develop novel treatment strategies for obesity and metabolic disorders like insulin resistance, metabolic syndrome, and type 2 diabetes.